Department of Agriculture

Report of Progress

of

RURAL ELECTRIFICATION ADMINISTRATION

by

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presented at

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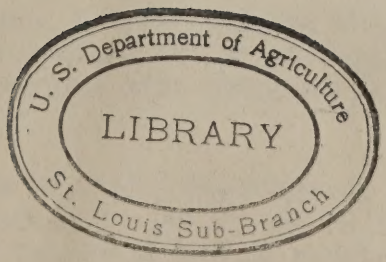


HIGHLIGHTS OF PROGRESS

Rural Electrification Administration

Appropriations to the end of the fiscal year 1941 totaled $374,003,635. Appropriations for fiscal 1940, $40,000,000; for fiscal 1941, $100,000,000.

Allotments as of April 1, 1941 totaled $364,309,121 an increase of 60 percent over the total of $227,340,899 for July 1, 1939. Total as of July 1, 1940, $269,012,942.

Loan Contracts Executed for fiscal year 1941 to April 4, $88,217,500; for fiscal 1940, $45,702,784; total for period since July 1, 1939, $133,920,284.

Construction Contracts Approved for fiscal year 1941 to April 4, $67,256,500; total for period since July 1, 1939, $107,926,843.

Funds Advanced as of March 1, 1941 totaled $266,367,631, an increase of 117 percent over the total of $122,339.824 for July 1, 1939. Total as of July 1, 1940, $221,287,287.

Weighted Miles Constructed as of March 1, 1941 totaled 304,318 miles, an increase of 123 percent over the total of 137,277 miles as of July 1, 1939. Total as of July 1, 1940, 241,493 miles.

Miles Energized as of March 1, 1941 totaled 281,231 miles, an increase of 144 percent over the total of 115,000 miles as of July 1, 1939. Total as of July 1, 1940, 233,166 miles.

Consumers Connected as of March 1, 1941 totaled 709,578, an increase of 164 percent over the total of 268,242 as of July 1, 1939. Total as of July 1, 1940, 567,998 consumers.

Applications as of April 1, 1941 totaled $77,822,200 or more than $68,000,000 in excess of funds available. By the beginning of the fiscal year 1942 unsatisfied applications will total $100,000,000.

Repayments-as of March 31, 1941 REA-financed systems had paid $9,755,668.84 on obligations totaling $7,333,114.64 on lines and generating loans due February 28, 1941. Only $186,195.04 remained unpaid. Advance payments as of February 28, 1941 therefore totaled $2,608,749.24

FOREWORD

This report is a brief, factual statement of REA progress as revealed by various over-all measures of accomplishment of the organization as a whole. Generally the measures referred to throughout the report do not reflect the work of any one functional division but record the collective achievement of the entire organization. Many activities that cannot be described in statistical terms have contributed to and made possible the results expressed by these over-all measures; in fact, there is no unit of REA, no matter how apparently remote from direct contact with REA borrowers, that has not contributed to the achievement revealed by the data.

In this consideration of REA progress there have been kept in mind two points of major importance: First, the social benefits of the program insofar as they can be measured -- inadequately to be sure -- by such over-all statistics as the number of farms connected; and second, the skill and effectiveness with which REA activities have been conducted insofar as they also can be measured by quantitative data.

Prior to the establishment of REA in 1935 rural electrification had progressed very slowly, and was restricted generally to a selected class of farm residents who were fortunate enough to live along the main roads extending between urban centers where density of population was relatively high, or in areas where the nature of farm activities, such as irrigation, made large power loads available at the outset. In most rural areas, however, extensions were usually short and favored these farms located in the more prosperous sections.

Looking back to January 1925, of the more than 6.3 million farms only 204,780, or 3.2 percent, were receiving central-station electric service. Chart No. 1 shows that during the succeeding six years the percentage increased slowly, reaching 10.2 in January 1931. From 1931 to January 1935 the increase was negligible, the percentage on the latter date being 10.9, or a gain of about seven-tenths of 1 percent in four years. In terms of number of farms connected during the 10-year period, this chart shows that the record is but slightly more impressive; the number increased from 204,780 in January 1925 to 649,919 in 1931 and to 743,954 in January 1935.

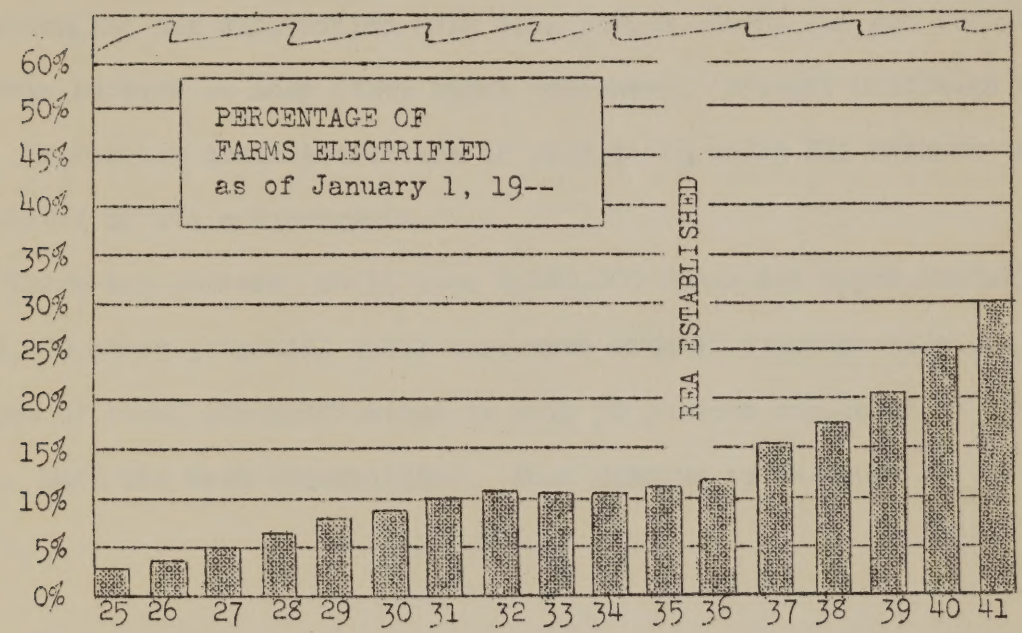
Many reasons have been advanced for the slow growth of rural electrification prior to 1935. The reasons given by the Mississippi Valley Committee in its October 1934 report were "the lack of interest by operating companies in rural electrification, high cost of line construction because of the unnecessarily expensive type of line used, onerous restrictions covering rural line extensions, and high rates."

With the establishment of REA in May 1935, rural electrification received a new stimulus and, as Chart No. 1 shows, began to expand rapidly. During the 6-year period, 1935-1940 inclusive, over 1,250,000 farms have been electrified, an increase of over 170 percent. Today, there are nearly 2,000,000 farms with electric service, or about 3 times as many farms electrified as when REA was established. Approximately 30 percent of the farms receiving central-station electric service are on REA-financed lines.

These statistics indicate that substantial progress is being made in electrifying the rural areas of the United States and that the rate of electrification is increasing.

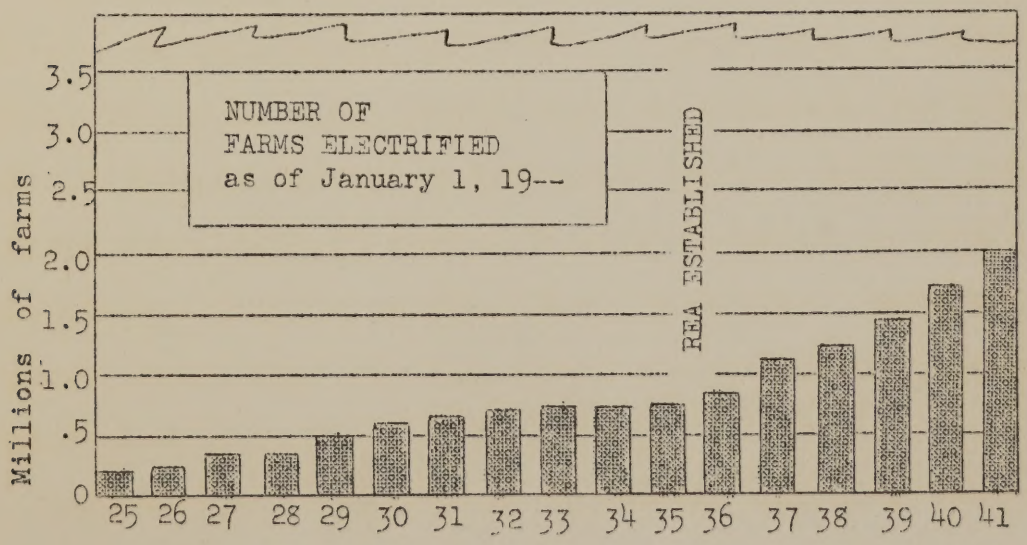
INCREASE IN RURAL ELECTRIFICATION IN THE UNITED STATES

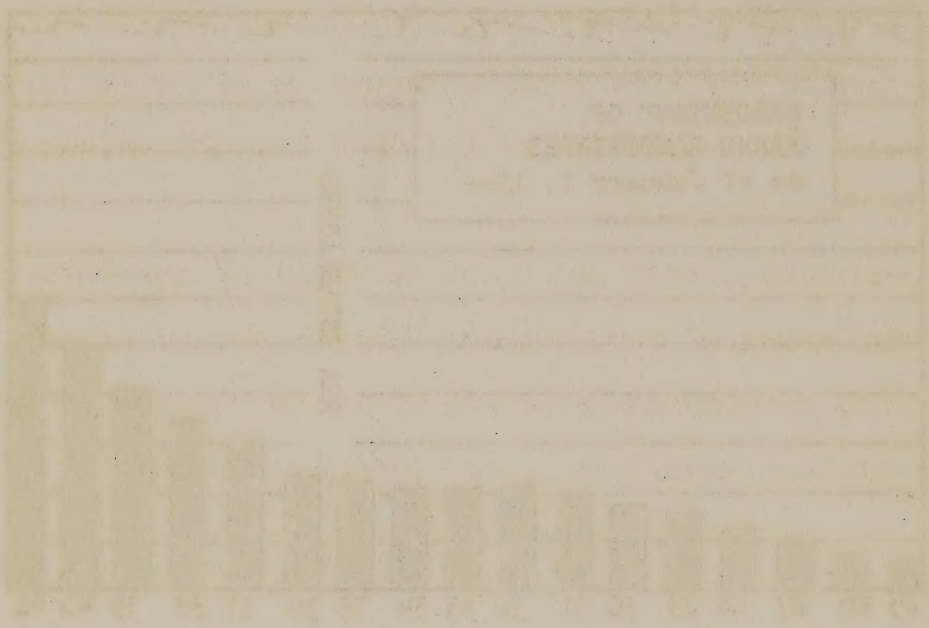
Since the REA was established the percentage of electrified farms increased from 10.9 in 1935 to 30.0 in 1941

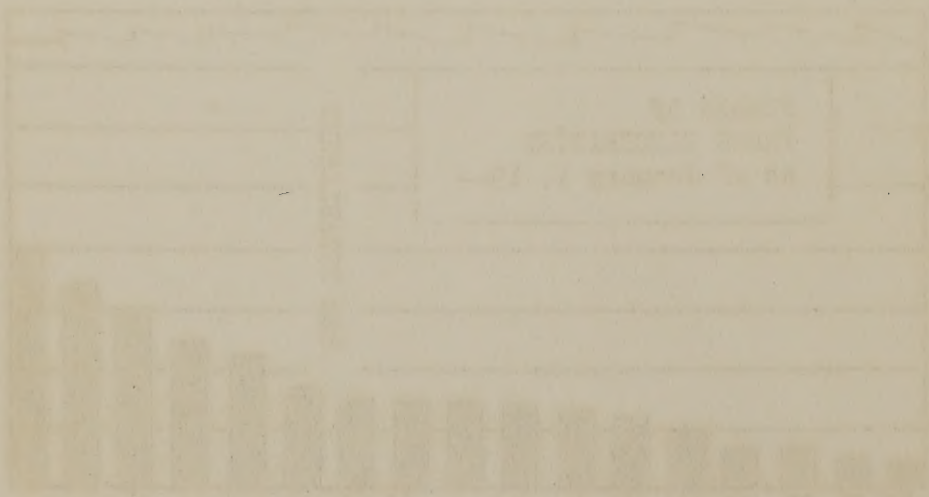


The number of electrified farms is now about 3 times as many as when REA was established.

The task, however, is only begun - more than 4 million farms and 1 million other potential rural consumers are still without electric service.







During fiscal 1940 and 1941 to March 1, REA-financed systems alone have brought service to more than 15 percent of the total number of farms now receiving central-station electric service. During the past 20 months, REA has electrified more than 350,000 farms and has brought electric service to many other rural consumers. Private utilities are also increasing their activities in this field, using REA methods and stimulated by its achievements.

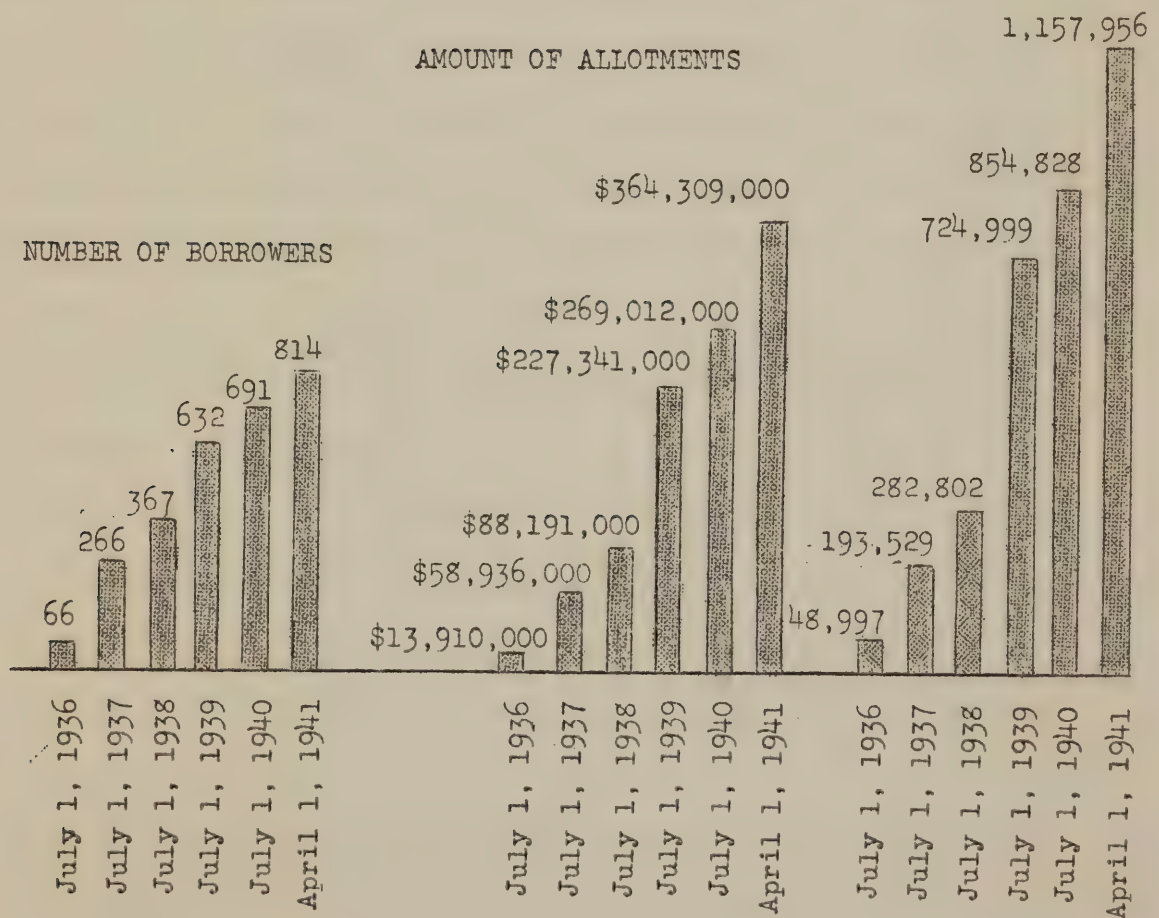
There are, however, still over 4,000,000 farms and approximately 1,000,000 other potential rural consumers without electric service. The job of rural electrification is only 30 percent completed at this time. Much has been accomplished. More remains to be done.

Chart 2

PROGRESS IN REA ACTIVITIES ALLOTMENTS

As of April 1, 1941 REA had made net allotments totaling $364,309,121 to 814 borrowers located in 45 states for systems designed to make electric service available to 1,158,000 rural consumers.

Of the 814 borrowers, 737 are cooperative associations, 25 are private utility companies, and 52 are public power districts, municipalities or other public bodies.



PROGRESS IN REA ACTIVITIES - CONSTRUCTION AND DEVELOPMENT

The growing importance of the Government's rural electrification program, and the accompanying increase in the magnitude of REA activities, are shown clearly by the statistics measuring growth and development.

Applications

The demand for expansion of REA services from the unserved rural areas continues. On April 1, 1941 applications on hand or known to be in preparation in the field totaled $77,822,200. This total exceeds by more than $68,000,000 the funds available at the present time. By June 30, 1941, the close of the present fiscal year, the REA will have a total of unsatisfied applications of approximately $100,000,000. Increasing uses for electric energy in rural areas have intensified demands and reduced costs have made areas once inaccessible from a financial point of view now perfectly feasible of development under the REA program. The desirability of adequate power in all areas for purposes of total defense is so obvious as to require no elaboration here.

Allotments and Consumers

Since July 1, 1939 there has been a marked increase in allotments and in the number of rural consumers that will be enabled eventually to obtain service. By April 1, 1941, total allotments of $364,309,121 had been made to 814 borrowers to make service eventually available to 1,157,956 farmers and other rural consumers. This should be compared with $227,340,899 to 632 borrowers on July 1, 1939; $88,191,070 to 367 borrowers on July 1, 1938; $58,936,217 to 266 borrowers on July 1, 1937;

and $13,910,404 to 66 borrowers on July 1, 1936.

Types of Borrowers

Over 93 percent of total allotments have been made to non-profit, cooperative enterprises, 5 percent to public bodies, and 2 percent to private utilities. The cooperatives and indirectly the public bodies are being and will continue to be operated in the interest of the users of electric energy. Their success will, doubtlessly, promote community spirit and operate to stimulate economic and social developments in rural areas.

Funds Advanced

The flow of funds in payment for materials, supplies, and labor used in constructing rural electric systems, continues to keep pace with the funds available for allotment. The amount of funds advanced to borrowers is an excellent measure of the real progress of REA activities and of the funds that are flowing out to labor and industry.

Total advances as of March 1, 1941 were $266,367,631 compared with $122,339,824 on July 1, 1939; $60,040,810 on July 1, 1938; $11,964,836 on July 1, 1937; and only $823,252 on July 1, 1936. During the past 20 months funds advanced by REA have exceeded the cumulative totals for prior periods.

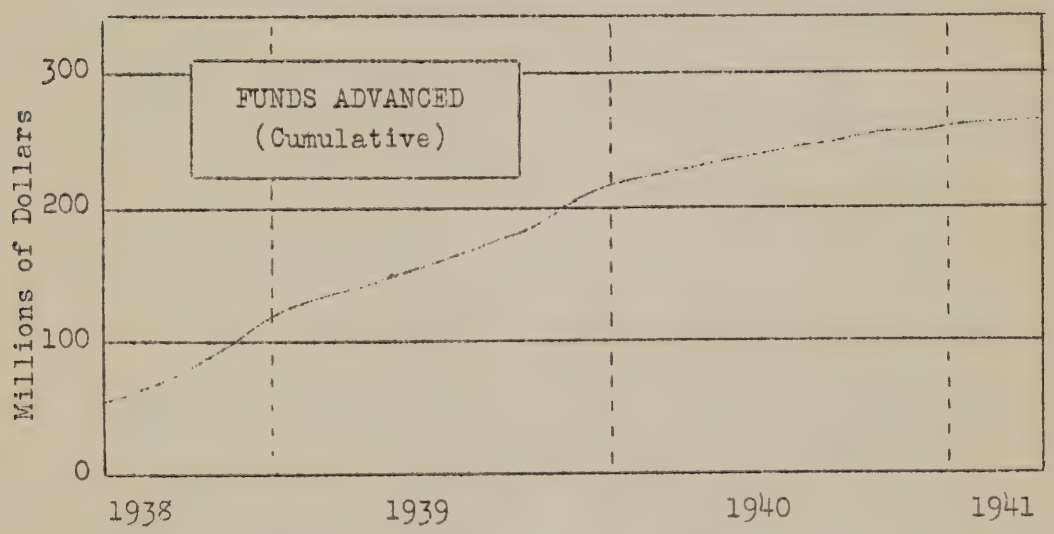
Miles Constructed

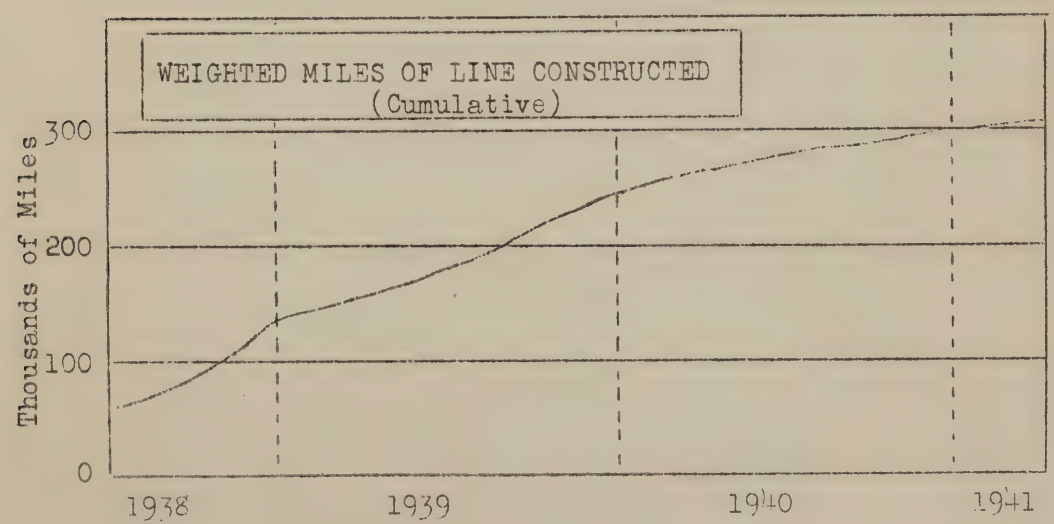
The total number of miles of line constructed by REA systems to date is sufficient to encircle the earth at the equator more than twelve times. By March 1, 1941 there had been built by these systems, in terms of weighted construction, a total of 304,318 miles of line. This represents an increase of 167,041 miles over July 1, 1939. On present sched-

PROGRESS IN REA ACTIVITIES - FUNDS ADVANCED
- MILES OF LINE CONSTRUCTED

By March 1, 1941 the REA had advanced a total of $266,367,631 for the construction of rural electric systems.

Weighted miles of line constructed by the REA-financed systems totaled 304,318 miles as of March 1, 1941. Construction at present rates exceeds 100,000 miles per year.





ules contractors on REA-financed lines are working at a rate sufficient to build approximately 100,000 miles of line annually.

Miles Energized and Consumers Connected

On March 1, 1941 there were 709,578 farms and other rural consumers receiving service from the 281,231 miles of energized lines of REA borrowers' systems. Miles of line energized, Chart No. 4, increased from 400 miles on July 1, 1936 to 8,000 miles on July 1, 1937, 40,000 miles on July 1, 1938, 115,000 miles on July 1, 1939. Consumers connected have kept pace with miles energized and the average on all lines has been maintained at approximately 2.5 consumers per mile. From 693 consumers on July 1, 1936 the number increased to 19,611 on July 1, 1937, 104,528 on July 1, 1938, and 268,242 on July 1, 1939.

The number of energized systems increased from 11 on July 1, 1936 to 45 on July 1, 1937, 248 on July 1, 1938, 417 on July 1, 1939, 630 on July 1, 1940 and 705 on March 1, 1941.

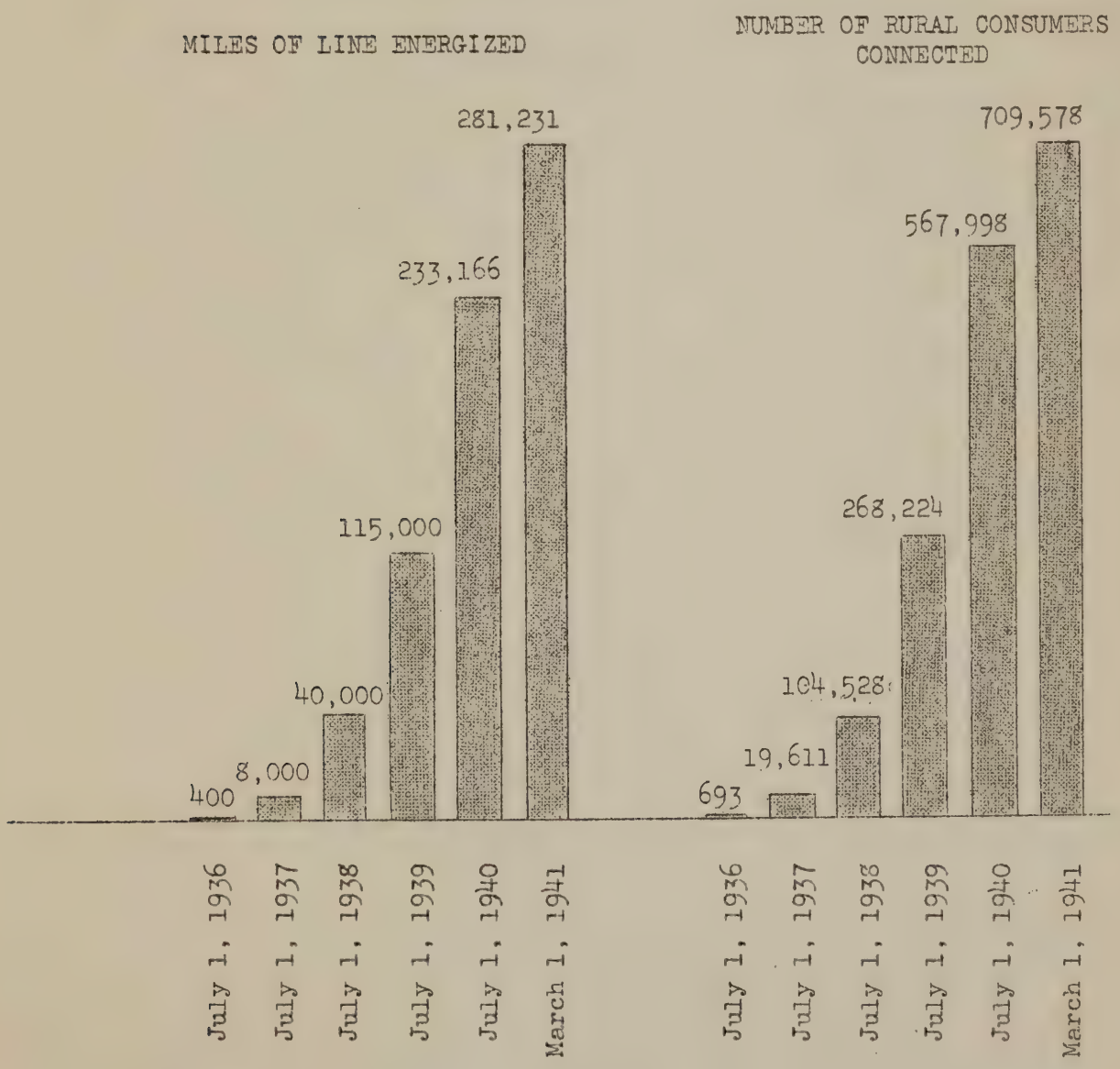
The membership campaigns conducted by many of the borrowers have resulted in a substantial increase in members, a corresponding improvement in consumer density, and a substantial increase in the annual revenues of borrowers' systems.

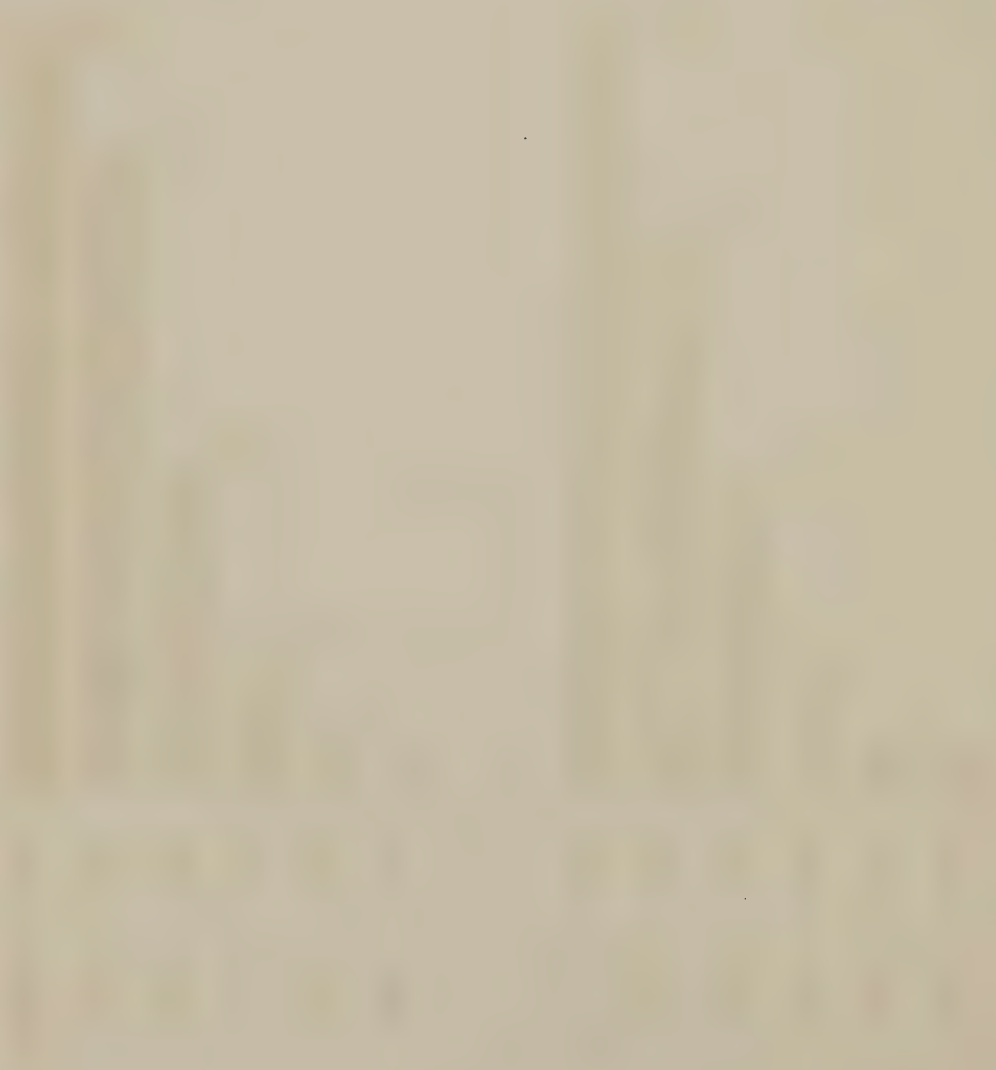
Chart 4

PROGRESS IN REA ACTIVITIES - MILES OF LINE ENERGIZED
- RURAL CONSUMERS CONNECTED

As of March 1, 1941 a total of 281,231 miles of line have been energized. A rate of energization in excess of 8,000 miles of line a month has been maintained for the past 20 months.

Rural consumers on REA-financed lines as of March 1, 1941 totaled 709,578. During the past 20 months more than 20,000 consumers per month have been connected to REA-financed lines.





SIGNIFICANT TRENDS - PROGRESS IN OPERATIONS OF REA BORROWERS' SYSTEMS

Data on the operations of REA-financed systems must be used with care in order to avoid false conclusions regarding the ultimate financial success of the program. Where businesses are expanding rapidly there is a continual dilution of the averages which makes them doubtful measures of operating conditions. Where lines are being energized and consumers connected daily in large numbers, end-of-year or end-of-month data related to operations for the year or month greatly understate the true economic relation existing between these data.

Many adjustments involving such complex statistical treatment as to lead to endless explanation and confusion are necessary to correct the averages for these conditions. These add little or nothing to the fundamental appreciation of the program. Charting an infant's growth and developments during its first few years gives some but not conclusive evidence as to its ultimate size and possibilities. The oldest REA-financed system has had its first mileage in operation only about five years and the weighted average age of all systems, based on consumers connected, is only 1.2 years.

At the present stage of development of the REA-financed systems, operation trends are the best indicators of progress toward financial stability. If gross revenues continue to increase more rapidly than operating expenses, if consumers continue to be added to the lines, and if consumption of energy continues to increase, then there is no question concerning the ultimate financial success of these systems.

In Chart No. 5 are presented the trends by age groups of significant measures of borrowers' operations. The figures presented are

median averages, based on the operating reports of 650 borrowers for the month of January 1941. The trends were obtained by arranging the reported figures in order of magnitude by age groups in accordance with the number of months that each borrower's system had been in operation. There are five such groups, beginning with borrowers having between 1 and 6 months of operating experience and continuing by 12-month intervals until the oldest group, which includes all borrowers that have been in operation between 43 and 58 months, is reached.

The averages of revenue per mile show a strong upward trend from $6.69 for the youngest systems (1-6 months) to $11.84 for the oldest group (43-58 months). Two principal factors account for this upward trend: the number of consumers per mile and the average revenue per consumer. Of the two, the former is the more important.

The figures showing average consumption of power by consumers reveal that, as farmers become better acquainted with the uses of electricity, the average kilowatt-hour consumption of power increases. The average kilowatt-hour per residential consumer increased from 47.6 for the youngest systems (1-6 months), to 57.6 for systems between 19 and 30 months of age, and to 71.4 for the oldest systems (43-58 months).

The improvement in consumer density, as systems obtain more operating experience, is apparent. The number of consumers per mile increases from 1.82 for the youngest systems (1-6 months) to 2.32 for systems between 19 and 30 months and to 2.65 for the oldest systems (43-58 months).

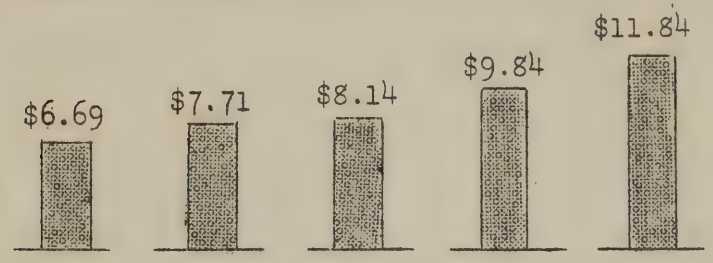
These trends are gratifying because they indicate that progress is being made toward more successful operation. They indicate that bor-

rowers' systems are building up more rapidly than had previously been thought probable. Judged by criteria such as these, REA borrowers show a promising future. It should be recognized, however, that these results have not come automatically but are being achieved by the collective efforts of all divisions of REA cooperating with the managements of borrowers' systems.

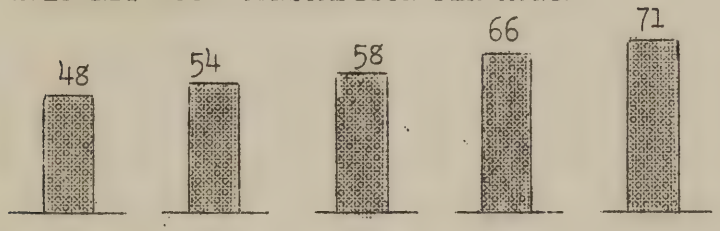
SIGNIFICANT TRENDS - REA-FINANCED SYSTEMS

Trends in operating statistics are amoung the best measures of progress. The following charts, based on 650 systems, show the excellent progress being made.

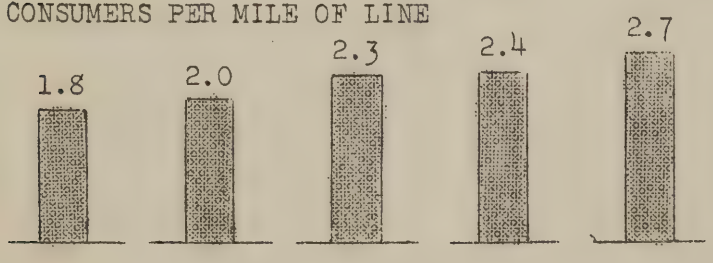
REVENUE PER MILE OF LINE



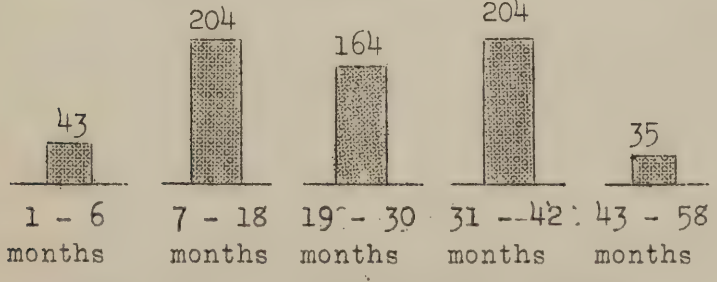
KILOWATT-HOUR CONSUMPTION PER MONTH



CONSUMERS PER MILE OF LINE



NUMBER OF SYSTEMS INCLUDED



AGE GROUPS OF REA-FINANCED SYSTEMS

PROGRESS IN REA ACTIVITIES - RELATION OF ACTUAL TO SCHEDULED PERFORMANCE

One of the best evidences of the effectiveness with which the staff of REA conducts and coordinates its activities is found in the relation of actual to scheduled performance in its lending activities. As of April 1 for the fiscal years 1939, 1940 and 1941 -- except for one item in 1939 -- the REA program has been ahead of schedule at every control point.

The following tabulation indicates for three important managerial control points the total work for the fiscal year completed as of April 1, 1939, 1940 and 1941.

PROGRESS OF REA PROGRAM AS OF APRIL 1

Item	Fiscal Years		
	1939	1940	1941
Appropriations for year	$140,000,000	$40,000,000	$100,000,000
Loan Contracts Executed	101,746,580	43,244,500	88,217,500
Released for Bids	87,154,658	40,481,226	79,134,500
Construction Contracts Approved	62,196,545	38,778,776	67,256,500

Allowing for the differences in the size of the programs and for the fact that a portion of the 1939 activities were carried over into 1940 it is obvious that during 1941 REA is more effectively converting dollars into light and power in rural America than was the case in the earlier years.

Since July 1, 1939 REA has recorded over 50 percent of its total accomplishments to date. In terms of various measures of progress the percentages are: appropriations 37 percent; allotments 37 percent; funds advanced 55 percent; miles energized 59 percent; consumers connected 62

percent. Practically all funds available are under allotment and by the end of the current fiscal year a substantial part of these funds will have been advanced. Thus REA will enter its new fiscal year with only a reasonable "back-log" as far as its construction program is concerned.

As the REA-financed systems have grown other problems have developed which the REA is attempting to solve in the same efficient pioneering manner that it attacked its lending and construction problems. Low-cost electric energy in rural areas and the ability of REA-financed systems to repay the Government with interest depends almost as much on efficient operation and maintenance as it does on low-cost construction and financing. REA, therefore, is developing methods of assisting its borrowers to obtain lowest possible costs. This makes it necessary to develop statistical material and to supply the borrowers with specialized managerial assistance of various kinds. Supplied by a central agency, the costs of these services are low and are more than compensated by the social benefits involved. Policies developed are available to all systems at a single cost and the pooling of data develops experience records on equipment and costs far more rapidly and accurately than would be possible on individual systems.

The development of managerial techniques to be used in the operation of REA-financed systems will contribute largely to the financial success of these enterprises, insure the return of the funds advanced, and reduce the costs of electric energy in rural areas in the United States.

REA TECHNICAL DEVELOPMENTS IN RURAL ELECTRIFICATION

So much has been said about REA contributions to rural electrification in line construction that it seems impossible that more could be said on the subject. Line construction costs now average about fifty percent of the cost prevailing before REA entered the field. These lower costs have reduced by at least twenty-five percent the revenues necessary for the successful operation of rural electric lines.

REA, however, continues its efforts to lower costs and increase the availability of electric energy to rural America. The end is not yet in sight. Many technical fields remain to be explored before it can be said that the ultimate goal has been reached. A few of the developments now in process which have gone beyond the purely experimental stage are:

1. Carrier signal -- an economical device which records automatically on a tape at headquarters the location and time of an outage on the line. It will, also, make a similar record when service is restored. This device will materially reduce the cost of restoring service as well as greatly improving the quality of service rendered.

2. Services -- a combination of meter and service box which uses circuit breakers instead of fuses. Economically installed by the cooperative it materially reduces the initial cost of obtaining electric service.

3. Appliances -- by cooperation with manufacturers small

low-cost copies of larger industrial units such as milk coolers, etc., are being developed for farm use.

4. Ground Testing Meter -- a device to measure adequacy of ground connection has been devised by REA engineers working with manufacturers which has reduced by 90 percent the cost of such devices.

REA engineers are working successfully in many fields to reduce costs and improve the quality of electric service. By increasing the efficiency of transformers and other line and operating equipment and by reducing their cost through simplification, standardization, or new techniques electric energy can be made available to more consumers in larger quantities. Another 25 percent cut in the revenues necessary for the successful operation of rural electric lines is not impossible. Five years ago the rural market was practically non-existent for electric equipment and services. Today it challenges the interest of every manufacturer working in this field.

ELECTRIC RATES ON REA-FINANCED LINES

In considering the rate schedules and revenues of REA-financed systems it is necessary to remember that the service is characterized by few consumers per mile, that service is relatively new and uses are undeveloped, and that the rates include amounts necessary to maintain the plant and to amortize its cost over a 25-year period.

Prior to the developments of REA the typical rural consumer had to pay for the line extension to his home or guarantee a high monthly bill and the energy used was billed under a rate usually averaging about nine cents per kilowatt-hour. Under REA a farmer living in areas with average densities, using 100 kilowatt-hours a month, will secure energy at approximately four and a half cents per kilowatt-hour. As the systems are developed there is every reason to believe that these rates will be materially reduced. Farmers using larger amounts of energy secure these larger amounts at from one and one-fourth cents to one and three-fourths cents per kilowatt-hour compared with the lowest incremental rural rate under most utility schedules of two to three cents per kilowatt-hour.

Due to the complexity of the rural rate schedules of most private utilities rate comparisons are not possible, but it is believed that the REA lines are offering electric service at rates as low or lower than those generally prevailing in rural communities.

PROGRESS IN REA ACTIVITIES - PAYMENTS BY BORROWERS

REA borrowers are similar to most new businesses in that they must go through an initial developmental period before they can establish themselves as highly profitable businesses. As is true of practically every new business enterprise, the revenues during the initial operating period frequently are not sufficient to cover all capital charges. The REA loan contract drafted in accordance with the Rural Electrification Act of the Congress recognizes this problem and steps up the rate of repayment in accordance with the increasing ability to pay.

Of the 814 REA-financed systems, few have been energized long enough and completely enough to be considered going concerns. All of them are connecting additional consumers every month, and many have large portions of their ultimate mileage under construction. The 705 borrowers with energized lines on March 1, 1941, had an average age based on consumers connected of but 1.2 years. In view of these conditions, it is gratifying to note that already more than one-half of the borrowers have made interest or principal payments out of earnings.

Evidence of the financial results of the program is contained in the figures showing the amounts currently due the Reconstruction Finance Corporation from the REA and the amounts available to meet those payments. All interest payments to the Reconstruction Finance Corporation have been made when due, and after each payment there has been a cash balance available for future interest payments. On March 31, 1941, after deducting all interest due or accrued as of that date the REA had a

cash balance of $4,915,283.43 available for future payments of interest and principal.

With relatively few exceptions the REA-financed systems have been making payments of interest and principal when due. The following tabulation shows the status of all borrowers on loans for distribution systems and generating plants as of February 28, 1941:

Accounts	Amount	Borrowers
Interest and Principal Due	$7,333,114.64	419
Interest and Principal Paid	9,755,668.84	485
Advance Payments	2,608,749.24	275
30 Days Overdue	186,195.04	51

This record -- particularly the record of advance payments -- indicates that the REA-financed systems as a whole are operating satisfactorily according to schedule. Marked progress is being made. With continuing good management and cooperation between the REA and its borrower systems, the operating trends and other statistics indicate that not only will the people secure the economic, social, and military benefits of electric energy in rural areas but the projects will be 100 percent self-liquidating from a financial point of view.